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PATENT

Atty. Docket No. INK-006

(2108/13)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANTS: Albert *et al.*

SERIAL NUMBER: 09/140,862

ART UNIT: 2778

FILING DATE: August 27, 1998

EXAMINER: David L. Lewis

TITLE: Color Electrophoretic Displays

BRIEF ON APPEAL

BOX AF
Commissioner for Patents
Washington, D.C. 20231

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Sir:

This is an appeal from the final rejection of claims 1-10 mailed by the patent office on April 9, 2001. A Notice of Appeal for this application was received by the United States Patent and Trademark Office on June 11, 2001.

A one-month extension of time up to and including September 12, 2001, for filing an Appeal Brief is respectfully requested. It is Appellants' understanding that September 11, 2001, will be considered as a "federal holiday within the District of Columbia" under 35 U.S.C.

§ 21(b). A petition for the extension of time and appropriate fee are being submitted concurrently herewith. Also submitted herewith is an Appendix presenting the claims on appeal, Exhibit A presenting evidence of the real party in interest, and Exhibit B presenting evidence of the meaning of relevant terms. The Appeal Brief, Appendix, and Exhibits A-B are submitted in triplicate in accord with 37 C.F.R. § 1.192(a).

(1) Real Party in Interest

The real party in interest in the above-identified patent application is E Ink Corporation. Assignments perfecting E Ink Corporation's interest in this application were submitted to the

U.S. Patent and Trademark Office on March 11, 1999 and June 9, 1999. Copies of the Assignments, the Notices of Recordation of Assignment Document, and the PTO-stamped Recordation Form Cover Sheets are attached hereto as Exhibit A.

(2) Related Appeals and Interferences

To the best of the Appellants knowledge, there are currently no related interferences. Appeals have been taken in United States Patent Application Serial No. 09/140,846, filed August 27, 1998 (Appeal Brief filed August 21, 2000), and in United States Patent Application Serial No. 09/140,792, filed August 27, 1999 (Appeal Brief filed September 10, 2001), and may be considered related to the instant appeal.

(3) Status of Claims

The claims on appeal are claims 1-10 of the instant application. Claims 1, 2 and 6 remain rejected under 35 U.S.C. § 103(a) over United States Patent No. 3,756,693 to Ota et al. ("Ota '693") and Japanese patent abstract publication number JP 01086116 by Naoyuki ("Nayouki")¹. Claims 3-5 and 7-10 remain rejected under 35 U.S.C. § 103(a) over Ota '693 in view of Naoyuki and United States Patent No. 3,870,517 to Ota et al. ("Ota '517"). The claims on appeal appear in the Appendix attached hereto.

(4) Status of Amendments

In the Final Office Action mailed from the U.S. Patent and Trademark Office on April 9, 2001, claims 1, 2 and 6 were rejected under 35 U.S.C. § 103(a) as unpatentable over Ota '693 and Naoyuki. Claims 3-5 and 7-10 were rejected under 35 U.S.C. § 103(a) as unpatentable over Ota '693 in view of Naoyuki and Ota '517. Appellants submitted a Notice of Appeal to the United States Patent and Trademark Office, which was received on June 11, 2001.

¹ Appellants note that in a teleconference conducted on September 15, 2000, the Examiner confirmed that JP 01086116 was miscited by the Office as JP 401086111A. Appellants further note that the reference continues to be miscited in Patent Office communications subsequent to the September 15, 2000, conversation. Therefore, Appellants treat references to JP 401086111A as references to JP 01086116.

(5) Summary of Invention

Appellants appeal the rejection of the invention claimed by claims 1-10. As defined by appealed claims 1, 2 and 6, Appellants invention relates to an electrophoretic display comprising at least one capsule (20), the capsule (20) includes one or more particles (50) and a suspending fluid (25), and at least two electrodes (30, 40) positioned adjacent the capsule. See, e.g., Specification, page 11, lines 22-27 and Figures 1A-1C. The capsule comprises at least a first particle having a first optical property and a first electrophoretic mobility. See, e.g., Specification, page 19, lines 23-26, and Figures 6, 7A-7B, 8A-8D, and 9A-9C. The application of an electric field to the capsule (20) by the electrodes (30, 40) causes the capsule (20) to change visual state in response to the optical properties and electrophoretic mobilities of the particles (e.g., R, G and B of Figures 6, 7A-7B, 8A-8D, and 9A-9C). Where the display has a first particle (e.g., B of Figures 7A -B) with a first electrophoretic mobility and a second particle (e.g., R or G of Figures 7A -B) with a second electrophoretic mobility, the first and the second electrophoretic mobility are, for example, substantially non-overlapping. See, e.g., Specification, page 20, lines 3-20, and Figures 7A-7B.

As defined by appealed claims 5, 8 and 9, Appellants invention also relates to an electrophoretic display comprising at least one capsule (20) having at least one particle (50) and a suspending fluid (25) and at least two electrodes (30, 40) disposed adjacent the at least one capsule (20). See, e.g., Specification, page 11, lines 22-27, and Figures 1A-1C. The suspending fluid may be dyed a color. See, e.g., Specification, page 12, line 14. A voltage potential applied to one of the electrodes causes particles to migrate within the capsule, changing the visual state of the capsule. See, e.g., Specification, page 18 lines 18-26. The at least one particle can have, for example, an optical property matching an optical property of one of the at least two electrodes. See, e.g., Specification, page 13, lines 20-21. The at least one particle may be, for example, a substantially white particle. See, e.g., Specification, page 19, line 7.

As defined by appealed claim 3, Appellants invention relates to an electrophoretic display comprising at least one capsule (20), the capsule (20) includes at least one red particle (R), at least one blue particle (B), and at least one green particle (G), a suspending fluid (25), and at least two electrodes (32, 34) positioned adjacent the capsule (20). See, e.g., Specification, page

20, lines 3-20, and Figures 6, 7A-7B, 8A-8D, and 9A-9C. The capsule (20) comprises at least a first particle having a first optical property and a first electrophoretic mobility and a second particle having a second optical property and a second electrophoretic mobility. See, e.g., Specification, page 19, lines 23-26. The application of an electric field to the capsule (20) by the electrodes (32, 34) causes the capsule (20) to change visual state in response to the optical properties and electrophoretic mobilities of the particles (R, G, and B). See, e.g., Specification, page 20, lines 3-20, and Figures 6, 7A-7B, 8A-8D and 9A-9C.

As defined by appealed claims 4 and 7, Appellants' invention relates to the electrophoretic displays described above in connection to claims 1 and 6, respectively, in which the suspending fluid is substantially transparent. See, e.g., Specification, page 12, line 12-13.

As defined by appealed claim 10, Appellants invention relates to an electrophoretic display comprising at least one capsule (20) containing a suspending fluid (25) and at least one white particle, disposed adjacent the capsule 20 and spaced apart from one another are electrodes that are cyan-colored (42), magenta-colored (44), yellow-colored (46), and white (48) electrodes. See, e.g., Specification, page 19, lines 5-8, and Figures 5A and 5B. A voltage potential applied to the various electrodes(42, 44, 46, and 48) causes the particles (55) to migrate and the capsule (20) to appear in different colors. See, e.g., Specification, page 19, lines 9-22, and Figures 5A and 5B.

(6) Issues

1. The first issue presented for appeal is whether appealed claims 1, 2 and 6 are patentable under 35 U.S.C. § 103(a) over Ota '693 in view of Naoyuki.
2. The second issue presented for appeal is whether appealed claims 5, 8 and 9 are patentable under 35 U.S.C. § 103(a) over Ota '693 in view of Naoyuki and Ota '517.
3. The third issue presented for appeal is whether appealed claim 3 is patentable under 35 U.S.C. § 103(a) over Ota '693 in view of Naoyuki and Ota '517.

4. The fourth issue presented for appeal is whether appealed claims 4 and 7 are patentable under 35 U.S.C. §103(a) over Ota '693 in view of Naoyuki and Ota '517.
5. The fifth issue presented for appeal is whether appealed claim 10 is patentable under 35 U.S.C. §103(a) over Ota '693 in view of Naoyuki and Ota '517.
6. Although Appellants believe that the above-identified two issues correspond to all of the pending rejections, Appellants also appeal any other bases for rejection of the pending claims which were not explicitly stated in the Final Office Action but which may be regarded as still pending.

(7) **Grouping of Claims**

The rejected claims 1-10 **do not** stand or fall together.

Claims 1, 2 and 6 stand or fall together.

Claims 5, 8 and 9 stand together

Claim 3 stands alone.

Claims 4 and 7 stand together.

Claim 10 stands alone.

(8) **Appellants' Argument**

Appellants believe that there are no outstanding claim rejections under 35 U.S.C. §112, first or second paragraph. The following arguments address each of the issues presented for appeal. Appellants respectfully request reversal of the final rejections of claims 1-10 under 35 U.S.C. § 103(a) because the references asserted by the Examiner do not teach or fairly suggest the inventions of Appellants' claims 1-10. Further, the references, evidence and arguments asserted by the Examiner fail to establish a *prima facie* case of obviousness against Appellants' claims 1-10.

8.1 Claims 1, 2 and 6 are patentable over Ota '693 in view of Naoyuki

Appellants respectfully request that the final rejection of claims 1, 2, and 6 under 35 U.S.C. § 103(a) be reversed because the references asserted by the Examiner do not enable the ordinary artisan to produce Appellant's invention as a whole. It is well settled that a prior art reference must place any allegedly disclosed matter in the possession of one of ordinary skill in the art such that it is capable of being put into practical operation. See, e.g., Seymour v. Osborn, 78 U.S. 516, 555, 20 L.Ed. 33, 42 (1870); In re Brown, 51 C.C.P.A. 1254, 1259, 329 F.2d 1006, 1011 (CCPA 1964). Further, to establish obviousness requires a showing that the prior art provides every limitation of a claim and the invention as a whole. See Graham v. John Deere Co., 383 U.S. 1, 17-18, 86 S.Ct. 684, 695-96, 148 U.S.P.Q. 459, 467 (1966); In re Royka, 490 F.2d 981, 985, 180 USPQ 580 (CCPA 1974); see also MPEP §§ 2142, 2143 (7th Ed., July 1998). As a result, a reference, or combination of references, that does not enable one of ordinary skill in the art to practice every limitation of a claim can not render that claim obvious. See, e.g., MPEP § 2121.01 (7th Ed., July 1998). Enablement of a limitation requires a description that: "enable[s] any person skilled in the art to which it pertains ... to make and use the same." 35 U.S.C. § 112, 1st paragraph. Accordingly, a combination of references, in view of knowledge in the art, cannot render a claim limitation obvious if there is no description of how to make and use said limitation.

Appellants respectfully submit that, either alone or in combination, Ota '693 and Naoyuki fail to enable one of ordinary skill in the art to practice the "encapsulation" limitation of:

[a]n electrophoretic display comprising: at least one capsule containing a suspending fluid and at least [one] particle

required by Applicants' claims 1, 2 and 6. As a result, Naoyuki cannot be properly combined with Ota '693 to produce Appellants' claimed invention as a whole because these references do not to provide any teaching that would enable one of ordinary skill in the art to modify Ota '693 with Naoyuki to provide the "capsule containing a suspending fluid and at least [one] particle" as set forth in Appellants' claims. Accordingly, the modification of Ota '693 with Naoyuki to produce Appellants' claims 1, 2 and 6 is improper, and the rejection of claims 1, 2 and 6, under 35 U.S.C. § 103(a) should not be maintained.

More particularly, Ota '693 does not mention encapsulated particles or even suggest, "at least one capsule containing a suspending fluid and at least [one] particle," as required by Appellants' claims. Appellants maintain that enclosing particles between two electrodes does not constitute encapsulation of particles as that term is used in the application because Appellants' capsule is a structure and claim element distinct from the electrodes. Specifically, in relevant part, Appellants' claims 1, 2 and 6 require:

An electrophoretic display comprising:
at least one capsule.; and
at least two electrodes disposed adjacent [said] capsule;

(emphasis added). Appellants thus submit that Ota '693 does not disclose a capsule, but rather unencapsulated particles disposed between electrodes. (See, e.g., Ota '693, col. 2, lines 21-41, see also Figs. 1a, 2-6). Accordingly, Ota '693 does not disclose a "capsule" that is separate and distinct from the electrodes because in Ota '693 the electrodes themselves are the walls that enclose the electrophoretic material. As a result, Ota '693 does not disclose "electrodes disposed adjacent [said] capsule" as set forth in Appellants' claims 1, 2 and 6. Moreover, the Final Office Action of April 9, 2001, at pages 2-3, admitted that, "...Ota ['693] is silent as to the display particles being within a capsule, the type that may be considered in plurality." Accordingly, Ota '693 does not disclose or suggest the "encapsulation" limitation of Appellants' claims 1, 2 and 6.

Naoyuki does not cure the deficiencies of Ota '693 because Naoyuki merely mentions encapsulated particles but provides no enabling description of making or using the limitation of, "at least one capsule containing a suspending fluid and at least [one] particle," as set forth in Appellants' claims 1, 2 and 6. Specifically, Naoyuki reads in its entirety:

ABSTRACT: PURPOSE: To facilitate the sealing treatment of a dispersion system and to assure a good electrophoretic display operation by adopting a technique to previously microcapsulate the dispersion system.

CONSTITUTION: The dispersion system 5 is previously microcapsulated and the microcapsules 3 are disposed between electrodes for display control. Since the compsn. of the microcapsulated dispersion system 5 are uniformly held and, therefore, the flocculation of the electrophoresis particles or the sticking thereof to electrodes is eliminated

and the uniform and stable display operation is accomplished. The handling of the dispersion system 5 or the sealing treatment of the dispersion system 5 is greatly improved without adversely affect the dispersion system 5 at the time of assembly. The electrophoretic display device having good characteristics is thus obtd.

Appellants' submit that absent some discussion of how to perform (i.e., make or use) Appellants' above "encapsulation" claim limitation, Naoyuki's mere mention of microencapsulation is simply a suggestion to try capsulated particles. Naoyuki's simple suggestion to try microencapsulation is insufficient to render that Appellants' "encapsulation" limitation obvious because one of ordinary skill in the art would have no reasonable expectation of successfully practicing Appellants' "electrophoretic display comprising: at least one capsule containing a suspending fluid and at least [one] particle."

For example, Naoyuki mentions "adopting a technique to previously microencapsulate," and that the, "microcapsules 3 are disposed between electrodes," but does not provide any description that enables one of ordinary skill in the art to make or use such capsules. Moreover, Naoyuki does not provide any description that enables one of ordinary skill to make or use "at least one capsule containing a suspending fluid and at least [one] particle" as set forth in Appellants' claims 1, 2 and 6. As a result, Appellants submit that claims 1, 2 and 6 are non-obvious because, either alone or in proper combination, Ota '693 and Naoyuki do not enable the above "encapsulation" limitation of these claims. Therefore, Appellants respectfully request reversal of the rejection of claims 1, 2, and 6.

In addition, Appellants submit that Naoyuki is also completely silent on the encapsulation of particles with different optical properties and electrophoretic mobilities. Specifically, Appellants' claims 1 and 2 require:

An electrophoretic display comprising:

at least one capsule containing a suspending fluid and at least a first particle and a second particle, said first particle having a first optical property and a first electrophoretic mobility and said second particle having a second optical property and a second electrophoretic mobility;

Particles that differ in these properties typically have substantially different surface properties. Particles with different surface properties will have different interactions with the surface of a capsule. As a result, there can be no reasonable expectation that an encapsulation or capsule material suitable for encapsulating particles with one surface property will work to encapsulate particles with different surface properties. Moreover, there can be no reasonable expectation that the behavior of particles with different surface properties will be the same within a capsule as within an unencapsulated medium (e.g., such as the medium of Ota '693). Thus, Naoyuki and Ota '693 do not render Applicants' claims 1 and 2 obvious because one of ordinary skill in the art would not have a reasonable expectation of successfully modifying or combining Ota '693 with Naoyuki to practice as required by these claims a "capsule containing [a] first particle having a first optical property and a first electrophoretic mobility and [a] second particle having a second optical property and a second electrophoretic mobility."

In the final rejection of claims 1, 2 and 6 under 35 U.S.C. § 103(a) over Ota '693 and Naoyuki the Examiner reasserted verbatim his prior conclusion regarding these claims that, "[m]odifying the display as taught by Ota to include capsulized particles is well known and would be obvious to the skilled artisan." (See Final Office Action of April 9, 2001, at page 3; cf. Office Action of August 29, 2000, at page 3). In the Final Office Action of April 9, 2001, the Examiner did not address the arguments made by Appellants in their Response filed January 29, 2001, that the references, in view of the art, lacked any teaching that would enable one of ordinary skill in the art to so modify Ota '693 with Naoyuki. Instead, the Examiner mischaracterized Appellants' arguments and ignored them.

In particular, in the Final Office Action, the Examiner stated,

The applicant argues Naoyuki et al. fails to teach how to encapsulate the particles in such a display as taught by Ota, however this point is irrelevant given the fact that the claims are not drawn to a process method for making or encapsulating particles of a display, they are merely drawn to a display apparatus. The applicant argues a moot point. Naoyuki's suggestion for encapsulating a display of the type taught by Ota is sufficient basis for the rejection.

(Final Office Action of April 9, 2001 at page 5). Appellants respectfully submit that a failure of a reference to enable a claim limitation is not irrelevant nor argument of a moot point. See e.g.,

Seymour, 78 U.S. at 555, 20 L.Ed. at 42. Although Appellants used the word “how” in their prior arguments, Appellants made clear from the beginning (and by the entire context of their argument) that the issue was how to make and use a claim limitation in accord with 35 U.S.C. § 112.

Furthermore, Appellants submit that the Examiners assertion that, “Naoyuki’s suggestion for encapsulating a display of the type taught by Ota is sufficient basis for the rejection,” is incorrect as a matter of law to establish either a *prima facie* case of obviousness or to maintain an rejection under 35 U.S.C. § 103(a). Specifically, three criteria must be met to establish a *prima facie* case of obviousness: (1) some suggestion or motivation to modify or combine the references; (2) a reasonable expectation of success; and (3) the combination must teach or suggest all the claim limitations. See Graham, 383 U.S. at 17-18, 86 S.Ct. at 695-96, 148 U.S.P.Q. at 467 ; In re Vaeck, 947 F.2d 488, 493, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991); see also MPEP § 2142 (7th Ed., July 1998). Accordingly, the Examiner’s position that, “Naoyuki’s suggestion for encapsulating a display of the type taught by Ota is sufficient basis for the rejection,” is in error and on its face indicates the Examiner’s basis for rejection of claims 1, 2 and 6 fails to establish a *prima facie* case of obviousness as a matter of law.

Thus, for the reasons described above, Appellants respectfully submit that claims 1, 2 and 6, are novel and nonobvious over Ota ‘693 in view of Naoyuki because these references, either alone or in proper combination, do not teach, fairly suggest or enable one of ordinary skill in the art to practice every limitation of these claims. Moreover, for the reasons above, Appellants submit that the Examiner has failed to establish a *prima facie* case of obviousness against claims 1, 2 and 6. Therefore, Appellants respectfully request reversal of the rejection of claims 1, 2 and 6.

8.2 Claims 5, 8 and 9 are patentable over Ota ‘693 in view of Naoyuki and Ota’517

Appellants’ respectfully submit that claims 5, 8 and 9 are patentable because Ota ‘517, Ota ‘693 and Naoyuki, either alone or in proper combination, do not provide an enabling disclosure of making or using the “encapsulation” limitation of: “at least one capsule containing a suspending fluid and at least [one] particle,” as set forth in Appellants’ claims 5, 8 and 9, which depend from either claim 1 or 6. To establish obviousness requires a showing that the prior art

provides every limitation of a claim and the invention as a whole. See Graham, 383 U.S. at 17-18, 86 S.Ct. at 695-96, 148 U.S.P.Q. at 467; In re Royka, 490 F.2d at 985; see also MPEP §§ 2142, 2143 (7th Ed., July 1998). Accordingly, Appellants respectfully request reversal of the rejection of claims 5, 8 and 9.

For the reasons described above with respect to claims 1, 2, and 6, Appellants submit that Ota '693 and Naoyuki fail to teach or fairly suggest the above "encapsulation" limitation of Appellants' claims 5, 8 and 9, and that Ota '517 fails to provide this missing teaching. Specifically, Appellants submit that Ota '517's enclosure of particles between two electrodes does not teach or fairly suggest, "at least one capsule containing a suspending fluid and at least [one] particle," because Appellants' capsule is a structure and claim element distinct from the electrodes. Specifically, in relevant part, Appellants' claims 5, 8 and 9 require:

An electrophoretic display comprising:
at least one capsule.; and
at least two electrodes disposed adjacent [said] capsule;

(emphasis added). Appellants thus submit that Ota '517 does not disclose a capsule, but rather unencapsulated particles disposed between electrodes. (See, e.g., Ota '517, col. 2, lines 46-55, see also Figs. 1a-1d, 2a-2b, 3a-3b, 4, and col. 8, lines 3-48, noting that item number 12 is porous to particle passage). Accordingly, Ota '517 does not disclose a "capsule" that is separate and distinct from the electrodes because in Ota '517 the electrodes themselves are the walls that enclose the electrophoretic material. As a result, Ota '517 does not disclose "electrodes disposed adjacent [said] capsule" as set forth in Appellants' claims 5, 8 and 9.

Thus, for the reasons described above, Appellants respectfully submit that claims 5, 8 and 9, are novel and nonobvious over Ota '693 in view of both Naoyuki and Ota '517 because these references, either alone or in proper combination, do not teach, fairly suggest or enable one of ordinary skill in the art to practice every limitation of these claims. Moreover, for the reasons above, Appellants submit that the Examiner has failed to establish a *prima facie* case of obviousness against claims 5, 8 and 9. Therefore, Appellants respectfully request reversal of the rejection of claims 5, 8 and 9.

8.3 Claim 3 is patentable over Ota '693 in view of Naoyuki and Ota'517

Appellants respectfully request that the final rejection of claim 3 under U.S.C. §103(a) be reversed, because the references asserted by the Examiner, either alone or in proper combination, also do not disclose or fairly suggest an electrophoretic display comprising “at least one capsule which includes at least one red, at least one blue and at least one green particle,” as required by Appellants’ claim 3. In particular, the teachings of Ota ‘517 are technologically incompatible with the use of red, green, and blue particles. As a result, the use of red, green and blue particles in Ota ‘517 would either change the basic principle under which the display of Ota ‘517 operates or render the display of Ota ‘517 inoperable for its intended purpose. A reference can not be properly modified to render a claim obvious under 35 U.S.C. § 103(a) or establish a *prima facie* case of obviousness when such a modification would change the principle of operation of the reference or render it inoperable for its intended purpose. See In re Gordon, 733 F.2d 900, 902, 221 U.S.P.Q. 1125 (Fed. Cir, 1984); In re Ratti, 270 F.2d 810, 813, 123 U.S.P.Q. 349, 352 (CCPA 1959). Accordingly, the modification of Ota ‘517 in combination with Ota ‘693 and Naoyuki to produce Appellants’ claim 3 is improper, and the rejection of claim 3 under 35 U.S.C. § 103(a) should not be maintained.

In the final rejection of claim 3 under 35 U.S.C. § 103(a) over Ota ‘693, Naoyuki, and Ota ‘517, the Examiner reasserted verbatim his prior conclusion that: “Ota (517) demonstrates how the two particles can be three in number and of varying colors...and since the particles can act as the primary image colorant the skilled artisan could obviously choose red, blue, and green as the particle colors.” (Final Office Action of April 9, 2001 at page 3; cf. Office Action of August 29, 2000 at page 3). In the Final Office Action of April 9, 2001, the Examiner did not address the arguments made by Appellants in their response dated January 29, 2001, regarding the technological incompatibility of Ota ‘517 with the use of red, green, and blue particles as defined by Appellants claim 3. The Examiner simply dismissed the technological incompatibility of using of red, green, and blue particles in Ota ‘517 with a conclusory response that the, “use of particles of varying colors is an obvious design choice and would have been obvious to the skilled artisan”. (Final Office Action of April 9, 2001 at page 5).

The teachings of Ota '517 are technologically incompatible with the use of red, green, and blue particles as set forth in claim 3 and nothing in Ota '693 or Naoyuki cures this technological incompatibility. Neither Ota '693 nor Naoyuki suggest the use of red, blue, and green particles as set forth in claim 3. Consequently, the references asserted by the Examiner, either alone or in combination, would not motivate one of ordinary skill in the art to combine and modify these references to produce a display comprising a capsule having red, green, and blue particles as set forth in Appellants' claim 3.

The technological teachings of Ota '517 teach choosing particles that have a photosensitive response to certain colors of light. (See, e.g., Ota '517, col. 3, line 55 to col. 4, line 5; col. 6, lines 33-66). To understand the display disclosure of Ota '517, it is important to realize the difference between a color (i.e., what a human eye perceives) and a color of light (i.e., a discrete, continuous electromagnetic spectrum wavelength range). For example, it is common knowledge that there is no "white color of light," rather the color we see as white is actually a combination of all the visible colors of light. Accordingly, the principle of operation of a photosensitive particle consists of responding to a color of light, not to colors. In contrast, Appellants' claimed invention does not require a photosensitive response on the part of its electrophoretic particles to work.

Specifically, Ota '517 is directed towards a, "photoelectrophoretic color image reproduction panel" (col. 2, lines 43-44) wherein, "[t]he [electrophoretic] material 6 consists of at least three kinds of photosensitive electrophoretic materials 6a, 6b and 6c, the colors of which are cyan, magenta and yellow, respectively, and have photosensitive response to red, green and blue light, respectively," (col. 2, lines 58-63)(emphasis added). The display of Ota '517 operates based on the principle of a photosensitive response to input light by particles that respond to their complementary color of light. For example, Ota '517 discloses that the cyan particles (e.g., item 6a) respond to red light, the magenta particles (e.g., item 6b) respond to green light, and the yellow particles (e.g., item 6c) respond to blue light. One of ordinary skill in the art, upon reading Ota '517, would understand that his particles are cyan, magenta and yellow because these colors are complementary to the light to which the particles are photosensitive. (See, e.g., Ota '517, col. 3, line 52 to col. 4, line 5). Further, the ordinary artisan would understand that Ota

'517's choice of particle color is not open ended, but rather, dictated by the principle of operation of his display, i.e., the need for a photosensitive response to a color of light. As a result, the technological teaching of Ota '517 makes clear that the colors of his particles are not mere design choices; rather, the particle colors are central to the very principle of operation of his display.

Ota '517's teachings of a display using particle colors that are photosensitive to a complementary light color teaches away from, and are technologically incompatible with, red, green and blue particles because there are no colors of light that are complementary to these particle colors. That the technological teaching of Ota '517 are incompatible with red, blue and green particles can be illustrated by the following example. For example, there is no color of light that is complementary to a green particle color. The color complementary to green is magenta. However, there is no color of light that is magenta because the color magenta is actually a combination of light from both the blue and the red portions of the electromagnetic spectrum. As is well know, red and blue are at opposite ends of the visible portion of the electromagnetic spectrum and are separated by at least the green part of the spectrum. Accordingly, if magenta light is input into a display as taught by Ota '517 that has been modified to use red, green and blue particles, there can be no reasonable expectation that the display will work for its intended purpose based on the technological teachings of Ota '517. The so modified display of Ota '517 can not be expected to work because it is not clear which of the red, green and blue particles (if any) will exhibit a photosensitive response to the magenta light which is actually composed of two colors of light, red and blue. Will the green particle respond? What if the input light is just red, does the green particle still respond? What if the input light is just blue, does the green particle still respond? If the green particle responds to just red and just blue light how does the display distinguish between red and blue so that it is not "color blind"? That these questions could not be answered by one of ordinary skill in the art based on the technological teachings of Ota '517 serves to further illustrate that the technological teachings of Ota '517, which rely on a photosensitive response, cannot be modified to use red, green, and blue particles.

Consequently, Ota '517 inherently teaches away from the use of red, green and blue particles as set forth in Appellants' claim 3 because these colors of particles will not work in the

technology taught by Ota '517. Moreover, one of ordinary skill in the art would have no reasonable expectation of successfully using the teachings of Ota '517 with red, green and blue particles and, in fact, would reasonably expect use of red, green and blue particles to render Ota '517 inoperable. As a result, one of ordinary skill in the art having found Ota '517 would have no motive to use its teachings to modify any other reference to have red, green and blue electrophoretic particles, and could not do so, because the teachings of Ota '517 fundamentally will not work with red, green and blue particles. Therefore, claim 3 is non-obvious over the art asserted by the Examiner because the asserted references fail to provide the limitation of, "at least one red particle, at least one blue particle, and at least one green particle," set forth in claim 3 and fail to teach the invention of claim 3 as a whole.

Thus, for the reasons described above, Appellants respectfully submit that claim 3 is novel and nonobvious over Ota '693 in view of Naoyuki and Ota '517 because these references, either alone or in proper combination, do not teach or suggest the limitation of, "wherein said capsule contains at least one red particle, at least one blue particle, and at least one green particle," required by Appellants' claim 3. Moreover, for the reasons above, Appellants submit that the Examiner has failed to establish a *prima facie* case of obviousness against claim 3. Therefore, Appellants respectfully request reversal of the rejection of claim 3.

8.4. Claims 4 and 7 are patentable over Ota '693 in view of Naoyuki and Ota '517

Appellants respectfully request that the final rejection of claims 4 and 7 under 35 U.S.C. § 103(a) be reversed because the references asserted by the Examiner can not be properly combined to disclose or fairly suggest an electrophoretic display with a "suspending fluid that is substantially transparent" as required by Appellants' claim 4 and 7. Rather, the Ota '517 reference relied on by the Examiner as disclosing a transparent suspending fluid actually teaches away from use of such a fluid in an electrophoretic display. There can be no suggestion to combine a reference with another if the reference teaches away from the combination. See Tec Air, Inc. v. Denso Mfg. Michigan, Inc., 192 F.3d 1353, 1359-60, 52 U.S.P.Q.2d 1294 (Fed. Cir. 1999); In re Fine, 837 F.2d 1071, 1075, 5 U.S.P.Q. 1596, 1599 (Fed. Cir. 1988). As a result, there is nothing in the cited references that would suggest to one of ordinary skill in the art to combine a transparent suspending fluid with an electrophoretic display to produce the invention

of claims 4 and 7. In addition, the Examiner has provided no facts or arguments to show that the nature of the problem or the knowledge of one of ordinary skill in the art would suggest the combination of Ota '517 with Ota '693 and Naoyuki. Absent a suggestion in the prior art to combine references, a rejection under 35 U.S.C. § 103(a) based on the combined references cannot be maintained. See In re Dembiczak, 175 F.3d 994, 999, 1000, 50 U.S.P.Q.2d 1614, (Fed. Cir. 1999)(abrogated in part on other grounds). Accordingly, the combination of Ota '517 with Ota '693 and Naoyuki to suggest Appellants' invention is improper, and do not establish a *prima facie* case of obviousness against claims 4 and 7. Thus, the rejection of claims 4 and 7 under 35 U.S.C. § 103(a) should be reversed.

In the final rejection of claims 4 and 7 under 35 U.S.C. § 103(a) over Ota '693, Naoyuki, and Ota '517, the Examiner reasserted verbatim his prior conclusion that: "[a]s in claims 4 and 7, Ota (517) teaches of a suspending fluid being transparent, column 4 lines 15-22, wherein colorless obviously implies transparent, column 1 lines 20-25." (Final Office Action of April 9, 2001 at page 3; cf. Office Action of August 29, 2000 at page 3). The Examiner did not address Appellant's prior argument with respect to this ground for rejection of claims 4 and 7 except to conclude, "Applicant's arguments filed 1/29/01 have been fully considered but they are not persuasive." (Final Office Action of April 9, 2001, at page 5).

Appellants respectfully submit that Ota '517 cannot be properly combined with Ota '693 and Naoyuki to reject claims 4 and 7 under 35 U.S.C. § 103(a) because Ota '517 teaches away from claims 4 and 7 as a whole. A reference "teaches away" when one of ordinary skill in the art, on reading the reference, would be discouraged from following the path set forth by the applicant, or would be led in a divergent direction from the path taken by the applicant. See Tec Air, 192 F.3d at 1359-60; In re Fine, 837 F.2d at 1075. A reference can discourage an artisan from following an applicant's path by indicating the claimed combination would not work. Id. In particular, the passage of Ota '571 at column 4, lines 15-22, cited by the Examiner to support his conclusion does not suggest use of a transparent suspending fluid because this passage discloses that a colorless suspending fluid will not work with the teachings of Ota '517.

Specifically, Ota '517 at col. 4, lines 15-22, states:

at both electrodes 8 and 9, one can observe a positive color image at the electrode 8 and a negative color image at the electrode 9. The material 6 and the suspending medium 7a both act as colorant in the reproduced image. If the suspending medium 7a is colorless, both of the areas subjected to black light or white light will have the same color, that is, a black color at both electrodes 8 and 9 in FIG. 1c.

(emphasis added). Far from suggesting a transparent suspending medium, this passage discloses that a colorless suspending medium will not work because if the fluid is colorless both black and white light have the same color in the image, i.e., there will be no contrast, the image will be black. Accordingly, Ota '517 at col. 4, lines 15-22, leads one of ordinary skill in the art away from the idea of combining a transparent suspending fluid in an electrophoretic display by teaching that this combination renders his electrophoretic display inoperable.

Similarly, the passage of Ota '517 at column 1, lines 20-25, cited by the Examiner does not provide a suggestion to combine a transparent suspending fluid with an electrophoretic display. Instead, the entire content of Ota '517 leads one of ordinary skill in the art in a direction divergent to that of claims 4 and 7 by focusing on colored suspending media. Specifically, Ota '517 at col. 1, lines 20-36, states:

According to these prior art methods, charged particles in a colorless suspending medium are transported to the surface of an electrode so as to reproduce a pattern corresponding to that of an input light image. The visible color image can be obtained by removing the electrode from the surface of the suspension, so that the suspension can not be enclosed in a housing. The particles act as the primary image colorant but the suspending medium does not because it is not colored. That is, the prior art does not seek to bring about a variation in the optical reflective property of a suspension itself due to a change in the spatial distribution of photosensitive particles in the suspension. Therefore, the prior art relates essentially to the reproduction of a permanent visible image but not to a changeable color display system.

(emphasis added). There is nothing in this passage to motivate or suggest the selection and use of the mentioned colorless suspending medium in an electrophoretic display to produce Appellants' claimed combination. On the contrary, the entire context of the remainder of Ota '517 teaches away from a colorless suspending medium by focusing exclusively on use of

colored suspending media for electrophoretic displays. See, e.g., col. 1, lines 44-47 (disclosing “photosensitive electrophoretic materials ... suspended in a white colored suspending medium”); col. 7, lines 18-21 (teaching “colored suspending medium 7a”); col. 8, lines 57-59 (teaching “colored suspending medium 7c”); col. 9, lines 50-52 (stating “[t]he electrophoretic suspension layer in accordance with the present invention having a white suspending medium”). As a result, there is no suggestion or motivation in Ota ‘517 to combine his mention of a colorless suspending medium with either Ota ‘693 or Naoyuki to produce the invention of Appellants’ claims 4 and 7. Furthermore, the Examiner has provided no facts or arguments to show that the nature of the problem or the knowledge of one of ordinary skill in the art suggested the combination of Ota ‘517 with Ota ‘693 and Naoyuki. Accordingly, absent Appellants’ application, there is no motivation to combine Ota ‘517 with either Ota ‘693 or Naoyuki to produce either claim 4 or 7.

Thus, for the reasons described above, Appellants respectfully submit that claims 4 and 7 are novel and nonobvious over Ota ‘693 in view of Naoyuki and Ota ‘517 because these references, either alone or in proper combination, do not teach or suggest an, “electrophoretic display ... wherein said suspending fluid is substantially transparent,” as required by claims 4 and 7. Moreover, for the reasons above, Appellants submit that the Examiner has failed to establish a *prima facie* case of obviousness against claims 4 and 7. Therefore, Appellants respectfully request reversal of the rejection of claims 4 and 7.

8.5. Claim 10 is patentable over Ota ‘693 in view of Naoyuki and Ota’517

Appellants respectfully request that the final rejection of claim 10 under 35 U.S.C. §103(a) be reversed, because Ota ‘693, Naoyuki and Ota ‘517, either alone or in proper combination, do not teach or fairly suggest an electrophoretic display having colored electrodes as claimed in Appellants’ claim 10. To establish obviousness, all the claim limitations must be taught or suggested. See Graham, 383 U.S. at 17-18, 86 S.Ct. at 695-96, 148 U.S.P.Q. at 467; In re Royka, 490 F.2d at 985; see also MPEP § 2142 (7th Ed., July 1998). Claim 10 defines an electrophoretic display comprising at least one capsule containing a suspending fluid and at least one white particle, electrodes that are cyan-colored, magenta-colored, yellow-colored, and white are disposed adjacent the capsule and spaced apart from one another.

Appellants submit that claim 10 is non-obvious because Ota '693, Naoyuki, and Ota '517, do not teach or fairly suggest colored electrodes or the use of a plurality of electrodes of differing colors as required by claim 10. Specifically, Appellants' claim requires, in part:

An electrophoretic display comprising...a cyan-colored electrode disposed adjacent said capsule; a magenta-colored electrode disposed adjacent said capsule ...a yellow-colored electrode disposed adjacent said capsule...and a white electrode adjacent said capsule.

The electrophoretic display of Appellants independent claim 10 thus comprises "colored electrodes" whereby the electrodes themselves are colored, not simply electrodes that appear colored because they are viewed through a color overlay. However, the references asserted by the Examiner describe only colored overlays or other colored structure that are not electrodes. Accordingly, the combination of Ota '517, Ota '693 and Naoyuki does not suggest the colored electrodes of Appellants' claim 10, nor establish a *prima facie* case of obviousness against this claim. Thus, the rejection of claim 10 under 35 U.S.C. § 103(a) should be reversed.

In the final rejection of claim 10 under 35 U.S.C. § 103(a) over Ota '693, Naoyuki, and Ota '517, the Examiner reasserted verbatim his prior argument that reads, in relevant part:

As in claim 10, Ota (693) in view of Naoyuki teaches of the invention as applied to claims 1-9 above, including the particle capsulized multicolored electrophoretic display whose particles have different mobilities according to the voltage bias on the colored coated electrodes. Further, Ota (517) teaches of particles of various colors, including cyan, magenta, yellow, and white, while also teaching of colored electrodes used to hide particles in a particular voltage-bias display state, column 9 lines 1-37.

(Final Office Action of April 9, 2001 at page 4; cf. Office Action of August 29, 2000 at page 4)(emphasis added). In the Final Office Action of April 9, 2001, the Examiner did not address the arguments made by Appellants in their response dated January 29, 2001, regarding the distinction and structural difference between a color overlay and colored electrodes as set forth in Appellants claim 10. The Examiner dismissed these distinctions and differences with a conclusory response, "Further the use of particles of varying colors is an obvious design choice and would have been obvious to the skilled artisan for the purpose of providing a color display, wherein a variety of color electrode and particle color schemes can be chosen". (Final Office Action of April 9, 2001 at page 5). However, Appellants submit that not only do the asserted

references fail to anywhere describe a colored electrode, but also that the Examiner's argument mischaracterizes the references and interprets relevant terms in a manner that does not comport with the accepted usage of the English language.

Specifically, Ota 517 fails to teach or suggest colored electrodes or a plurality of colored electrodes spaced apart from one another as recited in claim 10. The Examiner's conclusory assertion that Ota '517 teaches "colored electrodes used to hide the particles in a particular voltage-bias display state, column 9, lines 1-37," is unfounded because nowhere in column 9 is either a colored electrode mentioned or any hiding of particles by an electrode mentioned.

To the extent the Examiner intended to refer to some other portion of Ota '517 to support his conclusion that Ota '517 teaches colored electrodes, his conclusion remains unsupported by any portion of Ota '517. Appellants note that at column 7, line 66 to column 8, line 48, Ota '517 discusses a "colored porous layer 12" with pores that, "must be large enough to pass the particles of the electrophoretic material 6 therethrough and small enough to hide the electrophoretic material 6 from sight." (quoting col. 8, lines 39-42). However, there is no suggestion or indication from either the text or drawings of Ota '517 that this porous layer 12 is an electrode. Rather, Ota '517 figures 2a, 2b and accompanying text show that porous layer 12 is not an electrode. Accordingly, Ota '517 does not teach or suggest even a single colored electrode because, by any reading, Ota '517 does not even mention electrodes that are themselves colored.

Furthermore, Naoyuki does not teach or suggest colored electrodes because it makes no mention of color with respect to electrodes or particles, and Appellants do not believe the Examiner asserts otherwise.

Any assertion that Ota '693 teaches colored electrodes is unsupported by any citation to Ota '693. Furthermore, Ota '693 does not disclose, teach, or suggest colored electrodes or a plurality of different colored electrodes as set forth in Appellants' claim 10. Rather, Ota '693 discloses only color overlays, not colored electrodes. In fact, Ota '693 only teaches the use of transparent electrodes that are used in conjunction with a colored overlay. Specifically, Ota '693 teaches the colored overlay is not the electrode, but rather it may be "interposed between the transparent electrode and the suspension layer.", (Ota '693, col. 7, lines 35-47) and "[t]he colored layer 50...may be electrically insulating." (Ota '693, col. 7, lines 47-49). Accordingly, in

teaching colored overlays Ota '693 does not disclose, teach, or fairly suggest colored electrodes or provide any motivation to one of ordinary skill in the art to seek a colored electrode. Instead, Ota '693 teaches away from colored electrodes by leading the ordinary artisan in a direction divergent to that taken by Appellant in claim 10. That is, Ota '693 directs the artisan to transparent electrodes. Accordingly, Ota '693 fails to teach or suggest colored electrodes and in teaching the benefit of the extra layer, namely the colored overlay, with a transparent electrode, Ota '693 in fact teaches away from colored electrodes.

The overlay of Ota '693 does not "color" the underlying electrode because the color of the electrode is the same after the overlay is removed as it was before. Accordingly, the Examiner must be arguing that an electrode is a "colored electrode" because it appears to have a color when viewed through an overlay. To put it bluntly, such an argument is absurd. The Examiner's argument is equivalent to asserting that a piece of white paper is "red-colored paper" simply because the white paper is tucked into a transparent red sheet protector.

More particularly, the Examiner's argument is baseless because it ignores the plain meaning of Appellants' claims and the accepted usage of the English language. Accepted English usage would lead one of ordinary skill in the art to understand the term "colored electrodes" to refer to an electrode that is itself colored because the word "colored" is used as an adjective to denote a quality of the "electrode." Further, Appellants' application, figures and claims all support use of the term "colored electrode" as referring to an electrode that is itself colored. Accordingly, the overlays of Ota '693 do not provide "colored electrodes" as that term is used in Appellants' application, claim 10, or by one of ordinary skill in the art, because they do not change the color of the electrode itself.

Thus, for the reasons described above, Appellants respectfully submit that claim 10 is novel and nonobvious over Ota '693 in view of Naoyuki and Ota '517 because these references, either alone or in proper combination, do not teach or fairly suggest Appellants' claim 10 as a whole, and in particular, "colored electrodes," as claimed therein. Moreover, for the reasons above, Appellants submit that the Examiner has failed to establish a *prima facie* case of obviousness against claim 10. Therefore, Appellants respectfully request reversal of the rejection of claim 10.

8.6 The claimed invention is patentable under any other possible bases for rejection

Appellants believe that the foregoing arguments address each of the pending rejections of the pending claims. However, to the extent the Examiner's mention of a reference named "Saxe et al." is used as a basis for rejection, Appellants strongly urge that the Examiner's use of "Saxe et al." to support any rejection of claims 1-10, should not be permitted because it is improper and in direct violation of 37 C.F.R. § 1.104(d)(1). In particular, the Examiner fails to cite any information that would allow Appellant to identify this reference because he refers to this references simply as "Saxe et al." This directly violates 37 C.F.R. § 1.104(d)(1). See also MPEP § 707.05 (7th Ed., July 1998). The Examiner's failure to identify "Saxe et al." deprives Appellant of a fair opportunity to effectively respond to his assertions based thereon. Accordingly, Appellants respectfully request that "Saxe et al." and the Examiner's arguments based thereon be excluded from this appeal.

Nevertheless, Appellants submit the following out of an abundance of caution and without waiver or prejudice to Appellants' request to exclude the Examiner's comments based on "Saxe et al." or any future responses should "Saxe et al." be identified. To the extent that the Examiner refers to U.S. Patent No. 5,650,872 to Saxe et al. ("the '872 patent"), Appellant submits that this patent, either alone or in proper combination with Ota '693, Naoyuki, and Ota '517, does not anticipate or render obvious Appellants' claims. Appellants note that the '872 patent was asserted against Appellants' claims in a first Final Office Action dated May 23, 2000. In a Reply After Final Rejection filed July 24, 2000, Appellants fully responded to the Examiner's arguments based on the '872 patent. Subsequently, the Examiner withdrew his final rejection and issued a new Office Action dated August 29, 2000, in which the '872 patent was neither relied on nor mentioned. Appellants fully responded to the prior office action in a Response filed January 29, 2001, in which no amendments were made to Appellants claims or application. Subsequently, the Examiner issued a second Final Office Action on April 9, 2001, from which the present appeal is taken.

Specifically, Appellants have previously pointed out that the '872 patent discloses anisometric particles that respond to an electric field -not by migration- but by reorientation to become aligned. (see, e.g., the '872 patent, col. 1, lines 15-50, col. 2, lines 55-67, col. 3, lines 57-

59, col. 4, lines 8-26, and Figs. 3 and 4, item 21). This teaching of the '872 patent is distinctly different from that of Appellants application because "reorientation" does not encompass "migration" as the terms are used in the application, the '872 patent, and/or understood by those of ordinary skill in the art. Accordingly, the '872 patent does not anticipate nor render obvious Appellants' claimed inventions because the '872 patent does not disclose, teach or suggest the limitation of particle migration or that electrophoretic mobility is even a relevant property of the '872 patent's particles.

More particularly, particle orientation and/or alignment does not constitute nor inherently involve particle migration. Migration necessarily involves a translational motion as the term "migrate" is used in the application whereas orientation and/or alignment does not. For example, Webster's Ninth New Collegiate Dictionary defines "orient" as, "3: to cause the axes of the molecules of to assume the same direction" See Webster's Ninth New Collegiate Dictionary 832 (1984). This definition of "orient" is perfectly consistent with the understanding of the term by those of ordinary skill in the art and the '872 patent. As a result, a particle can "orient," or align," simply through rotational motion -no translational motion is required, inherent or implied. In contrast, the term "migrate" as used in the application and the art requires translational motion, i.e., motion from one location to another -not just simple rotation. Accordingly, Appellants respectfully submit that the '872 patent, either alone or in proper combination with Ota '693, Naoyuki, and Ota '517, does not anticipate or render obvious Appellants' claims.

Appellants believe that the foregoing arguments address each of the pending rejections of the pending claims. In particular, the present Brief addresses each of the rejections made final in the Final Office Action. Accordingly, Appellants submit that the present application meets all requirements for patentability.

(9) Conclusion

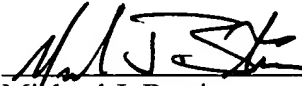
For the reasons given above, it is respectfully requested the final rejections be reversed and the application be passed to issue with claims 1-10 as presented in the Appendix attached hereto.

Appellants: Albert *et al.*
Serial No.: 09/140,862
Filing Date: August 27, 1998
Page 24

A Transmittal and Fee for the filing of this Brief on Appeal, as well as a Petition and Fee for a one-month extension of time are submitted herewith. Appellants believe that the present filing necessitates no other fees. However, if any additional fees are due, the Commissioner is hereby authorized to charge any such fees to Attorney's Deposit Account No. 20-0531.

Respectfully submitted,

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APPENDIX

1. An electrophoretic display comprising:
 - at least one capsule containing a suspending fluid and at least a first particle and a second particle, said first particle having a first optical property and a first electrophoretic mobility and said second particle having a second optical property and a second electrophoretic mobility; and
 - at least two electrodes disposed adjacent said capsule;
 - wherein application of an electric field to said capsule by said electrodes causes said capsule to change visual state responsive to the optical properties and electrophoretic mobilities of said particles.
2. The electrophoretic display of claim 1 wherein said first electrophoretic mobility and said second electrophoretic mobility are substantially non-overlapping.
3. The electrophoretic display of claim 1 wherein said capsule contains at least one red particle, at least one blue particle, and at least one green particle.
4. The electrophoretic display of claim 1 wherein said suspending fluid is substantially transparent.
5. The electrophoretic display of claim 1 wherein said suspending fluid is dyed.
6. An electrophoretic display comprising:
 - a substrate;
 - at least one capsule containing a suspending fluid and at least one particle;
 - at least two electrodes disposed adjacent the at least one capsule, said at least two electrodes disposed between said substrate and said at least one capsule,
 - wherein application of a voltage potential to one of said at least two electrodes causes said at least one particle to migrate within said capsule, causing said capsule to change its visual state.
7. The electrophoretic display of claim 6 wherein said suspending fluid is substantially transparent.

8. The electrophoretic display of claim 6 wherein said at least one particle has an optical property matching an optical property of one of said at least two electrodes.

9. The electrophoretic display of claim 6 wherein said at least one particle is substantially white.

10. An electrophoretic display comprising:
at least one capsule containing a suspending fluid and at least one white particle;
a cyan-colored electrode disposed adjacent said capsule;
a magenta-colored electrode disposed adjacent said capsule, said magenta-colored electrode spaced apart from said cyan-colored electrode;
a yellow-colored electrode disposed adjacent said capsule, said yellow-colored electrode spaced apart from said cyan-colored electrode and said magenta-colored electrode; and
a white electrode adjacent said capsule, said white electrode spaced apart from said cyan-colored electrode, said yellow-colored electrode, and said magenta-colored electrode;
wherein application of a voltage potential to said cyan-colored electrode, magenta-colored electrode, and yellow-colored electrode causes said white particles to migrate within the capsule to locations adjacent said cyan-colored electrode, said magenta-colored electrode, and said yellow-colored electrode causing said capsule to appear white, and wherein application of a second voltage potential to said cyan-colored, said magenta-colored, and said yellow-colored electrode causes said white particles to migrate within said capsule to a location adjacent said white electrode causing said capsule to appear substantially black.

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EXHIBIT A



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DOC DATE: 02/08/1999

ASSIGNOR:
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DOC DATE: 02/08/1999

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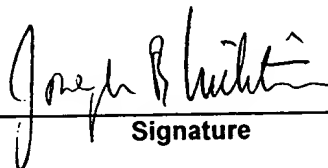
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PCT

PCT

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PCT

Number of Properties

Enter the total number of properties involved.

1

Fee Amount

Fee Amount for Properties Listed (37 CFR 3.41):

\$ 40

Method of Payment:

Enclosed ☒Deposit Account ☐

Deposit Account

(Enter for payment by deposit account or if additional fees can be charged to the account)

Deposit Account Number

20-0531

Authorization to charge additional fees:

Yes ☐ No ☒

Statement and Signature

To the best of my knowledge and belief, the foregoing information is true and correct and any attached copy is a true copy of the original document. Charges to deposit account are authorized, as indicated herein.

JOSEPH B. MILSTEIN

Name of Person Signing



Signature

2/26/99

Date

Attorney Docket No.
INK-006
(2108/13)

ASSIGNMENT

WHEREAS, We, Jonathan D. Albert and Barrett Comiskey have invented one or more improvements in:

Color Electrophoretic Displays

described in an application (or provisional application) for Letters Patent of the United States:

☐ identified by Attorney Docket No. INK-006, and/or executed by us of even date herewith and about to be filed in the United States Patent Office;

☒ Serial No. 09/140,862 filed in the United States Patent Office on 08/27/98; and

WHEREAS, E Ink Corporation (hereinafter "ASSIGNEE"), a corporation organized and existing under the laws of the State of Delaware, and having a usual place of business at 45 Spinelli Place, Cambridge, MA 02138 desires to acquire an interest therein, in accordance with agreements duly entered into with us;

NOW, THEREFORE, to all whom it may concern be it known that for and in consideration of said agreements and of other good and valuable consideration, the receipt of which is hereby acknowledged, we have sold, assigned and transferred and by these presents do hereby sell, assign and transfer unto said ASSIGNEE, its successors, assigns, and legal representatives, our entire right, title and interest in and throughout the United States of America, its territories and all foreign countries, in and to the inventions described in said application, together with our entire right, title and interest in and to said application and such Letters Patent as may issue thereon or claim priority under international convention, including but not limited to continuations, divisionals, reissues, and reexaminations of said application of such Letters Patent; said inventions, applications and Letters Patent to be held and enjoyed by said ASSIGNEE for its own use and behalf and for its successors, assigns and legal representatives, to the full end of the term for which said Letters Patent may be granted as fully and entirely as the same would have been held by us had this assignment and sale not been made; we hereby convey all of our rights arising under or pursuant to any and all international agreements, treaties or laws relating to the protection of industrial property by filing any such applications for Letters Patent. We hereby acknowledge that this assignment, being of our entire right, title and interest in and to said inventions, carries with it the right in ASSIGNEE to apply for and obtain from competent authorities in all countries of the world any and all Letters Patent by attorneys and agents of ASSIGNEE's selection and the right to procure the grant of all Letters Patent to ASSIGNEE for its own name as assignee of our entire right, title and interest therein.

AND, we hereby further agree for ourselves and our executors and administrators to execute upon request any other lawful documents and likewise to perform any other lawful acts which may be deemed necessary to secure fully the aforesaid invention to said ASSIGNEE, its successors, assigns, and legal representatives, but at its or their expense and charges, including: the execution of applications for patents in foreign countries; the execution of substitution, reissue, divisional or continuation applications; and preliminary or other statements or the giving of testimony in any interference or other proceeding in which said inventions or any application or patent directed thereto may be involved; and

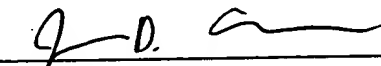
Joint Assignment
Page 2

we further hereby authorize ASSIGNEE or its attorneys or agents to insert the correct serial number and filing date into this assignment, if none is indicated on that date of our execution of this assignment;

AND, we do hereby authorize and request the Commissioner of Patents of the United States to issue such Letters Patent as shall be granted upon said application or applications based thereon to said ASSIGNEE, its successors, assigns, and legal representatives.

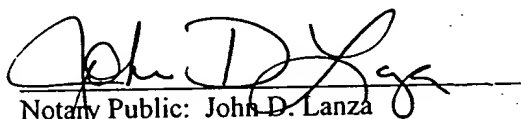
IN TESTIMONY WHEREOF, we have hereunto set our hands and affixed our seals the date set forth below.

Inventor:

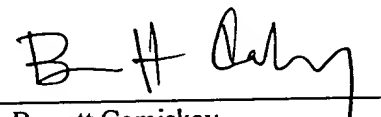

Jonathan D. Albert

Commonwealth of Massachusetts)
County of) ss

Subscribed and sworn to before me, by the above-named Jonathan D. Albert this
8th day of February, 1999.



Notary Public: John D. Lanza
My Commission Expires: July 29, 2005

Inventor:


Barrett Comiskey

Commonwealth of Massachusetts)
County of) ss

Subscribed and sworn to before me, by the above-named Barrett Comiskey this 8th day of
February, 1999.


Notary Public: John D. Lanza
My Commission Expires: July 29, 2005



UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office
ASSISTANT SECRETARY AND COMMISSIONER
OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

AUGUST 16, 1999

PTAS

TESTA, HURWITZ, THIBEAULT, LLP
JOSEPH B. MILSTEIN
125 HIGH STREET
HIGH STREET TOWER
BOSTON, MA 02110



101067089A

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REEL/FRAME: 010016/0684
NUMBER OF PAGES: 4

BRIEF: ASSIGNMENT OF ASSIGNOR'S INTEREST (SEE DOCUMENT FOR DETAILS).

ASSIGNOR:
JACOBSON, JOSEPH M.

DOC DATE: 06/07/1999

ASSIGNEE:
E INK CORPORATION
45 SPINELLI PLACE
CAMBRIDGE, MASSACHUSETTS 02138

SERIAL NUMBER: 09140862
PATENT NUMBER:

FILING DATE: 08/27/1998
ISSUE DATE:

LAWAN FLETCHER, EXAMINER
ASSIGNMENT DIVISION
OFFICE OF PUBLIC RECORDS

RECEIVED

AUG 25 1999

PATENT DEPARTMENT
TESTA, HURWITZ & THIBEAULT

06-16-1999


 101067089 COVER SHEET
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Conveying Party(ies)

☐ Mark if additional names of conveying parties attached
Name Joseph M. JacobsonName Name Name Name
 Execution Date
 Month Day Year

06/07/99

Receiving Party

☐ Mark if additional names of receiving parties attached
Name (line 1) E Ink CorporationName (line 2) Address (line 1) 45 Spinelli PlaceAddress (line 2) Address (line 3) Cambridge

City

 MA

State/Country

 02138

Zip Code

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Domestic Representative Name and Address

Enter for the first Receiving Party only.

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01 FC:581

40.00 OP

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Correspondent Name and Address

Area Code and Telephone Number

Name Patent Administrator

Address (line 1) Testa, Hurwitz & Thibault, LLP

Address (line 2) High Street Tower

Address (line 3) 125 High Street

Address (line 4) Boston, MA 02110

Pages Enter the total number of pages of the attached conveyance document including any attachments.

2

Application Number(s) or Patent Number(s)

☐ Mark if additional numbers attached

Enter either the Patent Application Number or the Patent Number (DO NOT ENTER BOTH numbers for the same property).

Patent Application Number(s)

Patent Number(s)

09/140,862

Patent Cooperation Treaty (PCT)

Enter PCT application number only if a U.S. Application Number has not been assigned.

PCT

PCT

PCT

PCT

PCT

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Number of Properties

Enter the total number of properties involved.

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Fee Amount for Properties Listed (37 CFR 3.41):

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Deposit Account

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Deposit Account Number

#

20-0531

Authorization to charge additional fees:

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Statement and Signature

To the best of my knowledge and belief, the foregoing information is true and correct and any attached copy is a true copy of the original document. Charges to deposit account are authorized, as indicated herein.

JOSEPH B. MILSTEIN
Name of Person Signing

Signature

Date

PATENT

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Name Joseph M. Jacobson

Name

Name

Name

Name

Execution Date
Month Day Year

06/07/99

Receiving Party

☐ Mark if additional names of receiving parties attached

Name (line 1) E Ink Corporation

Name (line 2)

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Name

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Area Code and Telephone Number

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Address (line 3) 125 High Street

Address (line 4) Boston, MA 02110

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Patent Application Number(s)

09/140,862

Patent Number(s)

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Authorization to charge additional fees:

Yes ☒No ☐

Statement and Signature

To the best of my knowledge and belief, the foregoing information is true and correct and any attached copy is a true copy of the original document. Charges to deposit account are authorized, as indicated herein.

JOSEPH B. MILSTEIN

Name of Person Signing



Signature

June 9, 1999

Date

ASSIGNMENT

WHEREAS, I, Joseph Jacobson, have invented one or more improvements in

Color Electrophoretic Displays

described in an application (or provisional application) for Letters Patent of the United States:

☐ identified by Attorney Docket No. _____, and/or executed by me of even date herewith and about to be filed in the United States Patent Office;

☒ Serial No. 09/140,862 filed in the United States Patent Office on August 27, 1998; and


WHEREAS, E Ink Corporation (hereinafter "ASSIGNEE"), a corporation organized and existing under the laws of the State of Delaware, and having a usual place of business at 45 Spinelli Place, Cambridge, Massachusetts 02138 desires to acquire an interest therein, in accordance with agreements duly entered into with me;

NOW, THEREFORE, to all whom it may concern be it known that for and in consideration of said agreements and of other good and valuable consideration, the receipt of which is hereby acknowledged, I have sold, assigned and transferred and by these presents do hereby sell, assign and transfer unto said ASSIGNEE, its successors, assigns, and legal representatives, my entire right, title and interest in and throughout the United States of America, its territories and all foreign countries, in and to the inventions described in said application, together with my entire right, title and interest in and to said application and such Letters Patent as may issue thereon or claim priority under international convention, including but not limited to continuations, divisionals, reissues, and reexaminations of said application of such Letters Patent; said inventions, applications and Letters Patent to be held and enjoyed by said ASSIGNEE for its own use and behalf and for its successors, assigns and legal representatives, to the full end of the term for which said Letters Patent may be granted as fully and entirely as the same would have been held by me had this assignment and sale not been made; I hereby convey all of my rights arising under or pursuant to any and all international agreements, treaties or laws relating to the protection of industrial property by filing any such applications for Letters Patent. I hereby acknowledge that this assignment, being of my entire right, title and interest in and to said invention, carries with it the right in ASSIGNEE to apply for and obtain from competent authorities in all countries of the world any and all Letters Patent by attorneys and agents of ASSIGNEE's selection and the right to procure the grant of all Letters Patent to ASSIGNEE for its own name as assignee of my entire right, title and interest therein.

AND, I hereby further agree for myself and my executors and administrators to execute upon request any other lawful documents and likewise to perform any other lawful acts which may be deemed necessary to secure fully the aforesaid invention to said ASSIGNEE, its successors, assigns, and legal representatives, but at its or their expense and charges, including: the execution of applications for patents in foreign countries; the execution of substitution, reissue, divisional or continuation applications; and preliminary or other statements or the giving of testimony in any interference or other proceeding in which said invention or any application or patent directed thereto may be involved; and I further hereby authorize ASSIGNEE or its attorneys or agents to insert the correct serial number and filing date into this assignment if none is indicated on that date of my execution of this assignment;

AND, I do hereby authorize and request the Commissioner of Patents of the United States to issue such Letters Patent as shall be granted upon said application or applications based thereon to said ASSIGNEE, its successors, assigns, and legal representatives.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed my seal the date set forth below.

Inventor: 
Joseph Jacobson

Dated: 6/7/99

Commonwealth of Massachusetts)
County of Middlesex) ss

Subscribed and sworn to before me, by the above-named Joseph Jacobson this 7th day of June, 1999.

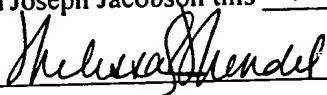

Notary Public
My Commission Expires: Nov. 25, 2005

EXHIBIT B

organ of Corti \-'kört-ē\ [Alfonso Corti †1876 Ital. anatomist] (1882) : a complex epithelial structure in the cochlea that rests on the internal surface of the basilar membrane and in mammals is the chief part of the ear by which sound is directly perceived

organ-o-ge-ne-sis \ōr-gə-nō-'jēn-ə-səs, ōr-gan-ə-\ n [NL] (ca. 1860) : the origin and development of bodily organs — compare MORPHOGENESIS — **organ-o-ge-netic** \-jə-'net-ik\ adj — **organ-o-ge-net-i-cal-ly** \-i-k(ə)-lī\ adv

organ-o-lep-tic \ōr-gə-nō-'lep-tik, ōr-gan-ə-\ adj [F *organoleptique*, fr. *organ-* + Gk *lēptikos* disposed to take, fr. *lambainein* to take — more at LATCH] (1852) 1 : being, affecting, or relating to qualities (as taste, color, odor, and feel) of a substance (as a food or drug) that stimulate the sense organs 2 : involving use of the sense organs (~ evaluation of foods) — **organ-o-lep-ti-cal-ly** \-i-k(ə)-lī\ adv

organ-ol-o-gy \ōr-gə-'nāl-ə-jē\ n [ISV] (ca. 1842) : the study of the organs of plants and animals

organ-mer-cu-ri-al \ōr-gan-ə-'(m)ər-'kyūr-ē-əl\ n (1938) : an organic compound or a pharmaceutical preparation containing mercury

organ-me-tal-lic \-mā-'tal-ik\ adj [ISV] (1852) : of, relating to, or being an organic compound that usu. contains a metal or metalloid bonded directly to carbon — **organometallic** n

or-ga-non \ōr-gə-'nān\ n [Gk. lit. tool — more at ORGAN] (1543) : an instrument for acquiring knowledge; *specif* : a body of principles of scientific or philosophic investigation

organ-o-phos-phate \ōr-gan-ə-'fās-'fāt\ n (1949) : an organophosphorus pesticide — **organophosphate** adj

organ-o-phos-pho-rus \-fās-'fās-'rās\ also **organ-o-phos-pho-rous** \-fās-'fās-'rās\ adj (1950) : of, relating to, or being a phosphorus-containing organic pesticide (as malathion) that acts by inhibiting cholinesterase — **organophosphorus** n

organ-pipe cactus n (1908) : any of several tall upright cacti of the southwestern U.S. and adjacent Mexico: a : SAGUARO b : a cactus (*Leimnecereus marginatus* or *Pachycereus marginatus*) that branches at the base to form several ridged upright stems and bears 2-inch red and greenish white flowers

or-ga-num \ōr-gə-'nām\ n [ML. fr. L. *organ*] (1614) 1 : ORGANON 2 : early polyphony of the late Middle Ages that consists of one or more voice parts accompanying the cantus firmus in parallel motion usu. at a fourth, fifth, or octave above or below; also : a composition in this style

organ-za \ōr-'gan-zə\ n [prob. alter. of *Lorganza*, a trademark] (1820) : a sheer dress fabric resembling organandy and usu. made of silk, rayon, or nylon

organ-zine \ōr-gan-'zēn\ n [F or It; *Organsin*, fr. *It. organzino*] (1699) : a raw silk yarn used for warp threads in fine fabrics

orgasm \ōr-'gəz-əm\ n [NL *orgasmus*, fr. Gk *orgasmos*, fr. *organ* to grow ripe, be lustful; akin to Skt *urjā* sap, strength] (1763) : intense or paroxysmal emotional excitement; esp. : the climax of sexual excitement typically occurring toward the end of coitus — **orgas-mic** \ōr-'gəz-mik\ also **orgas-tic** \-gəz-'tik\ adj

org-est \ōr-'gəst\ n [F, fr. MF, fr. *orge* barley, fr. L *hordeum*; akin to OHG *gersta* barley, Gk *kri*] (1754) : a sweet almond-flavored nonalcoholic syrup used as a cocktail ingredient or food flavoring

orgi-as-tic \ōr-'jē-'as-tik\ adj [Gk *orgiaistikos*, fr. *orgiazein* to celebrate orgies, fr. *orgia*] (1698) 1 : of, relating to, or marked by orgies 2 : characterized by unrestrained emotion — **orgi-as-ti-cal-ly** \-i-k(ə)-lī\ adv

orgone \ōr-'gōn, -gōn\ n [prob. fr. *orgasm* + *-one* (as in *hormone*)] (1942) : a vital energy held to pervade nature and to be made available for use by the human body by sitting in a specially designed box

orgu-lous \ōr-'(y)ə-ləs\ adj [ME, fr. OF *orgueilleux*, fr. *orgueil* pride, of Gmc origin; akin to OHG *arguol* distinguished] (13c) : PROUD

orgy \ōr-'jē\ n, pl *orgies* [MF *orgie*, fr. L *orgia*, pl. fr. Gk; akin to Gk *ergon* work — more at WORK] (1589) 1 : secret ceremonial rites held in honor of an ancient Greek or Roman deity and usu. characterized by ecstatic singing and dancing 2 a : drunken revelry b : an excessive sexual indulgence (as at a wild party) 3 : something that resembles an orgy in lack of control or moderation (soldiers engaging in an ~ of destruction)

-oria pl of -ORIUM

ori-al \ōr-'ē-əl, -ōr-'ē-\ adj suffix [ME, fr. L *orius* -ory + ME -al] : of, belonging to, or connected with (combinatorial)

ori-ba-tid \ōr-'rib-ət-əd, -ōr-'bat-əd\ n [NL *Oribatidae* (coextensive with *Oribatoidea*), fr. *Oribata*, genus name, fr. Gk *oribatēs* walking the mountains, fr. *oros* mountain + *-batēs*, fr. *bainein* to go — more at RISE, COME] (1948) : any of a superfamily (Oribatoidea) of small oval eyeless nonparasitic mites having a heavily sclerotized integument with a leathery appearance — **oribatid** adj

ori-el \ōr-'ē-əl, -ōr-'ē-\ n [ME, porch, oriel, fr. MF *oriel* porch] (14c) : a large bay window projecting from a wall and supported by a corbel or bracket

orient \ōr-'ē-ənt, -ōr-, -ē-ent\ n [ME, fr. MF, fr. L *orient*, *oriens*, fr. pp. of *ori* to rise — more at RISE] (14c) 1 *archaic* : EAST 1b *cap* : EAST 2 3 a : a pearl of great luster b : the luster or sheen of a pearl

orient adj (15c) 1 *archaic* : ORIENTAL 2 a : LUSTROUS, SPARKLING (~ gems) b *archaic* : RADIANT, GLOWING 3 *archaic* : rising in the sky

orient \ōr-'ē-ent, -ōr-, -ē-\ vi [F *orienter*, fr. MF, fr. *orient*] (1727) 1 a : to cause to face or point toward the east; *specif* : to build (a church or temple) with the longitudinal axis pointing eastward and the chief altar at the eastern end b : to set or arrange in any determinate position esp. in relation to the points of the compass c : to ascertain the bearings of 2 a : to set right by adjusting to facts or principles b : to acquaint with the existing situation or environment 3 : to cause the axes of the molecules of to assume the same direction

orient-al \ōr-'ē-ent-əl, -ōr-'ē-\ adj (14c) 1 *often cap* : of, relating to, or situated in the Orient 2 a : of superior grade, luster, or value b : being corundum or sapphire but simulating another gem in color 3 *often cap* : of, relating to, or having the characteristics of Orientals 4 *cap* : of, relating to, or constituting the biogeographic region that includes Asia south and southeast of the Himalayas and the Malay archipelago west of Wallace's line — **orient-al-ly** \-lī-\ adv

Oriental n (15c) : a member of one of the indigenous peoples of the Orient

oriental fruit moth n (1921) : a small nearly cosmopolitan moth (*Graptolitha molesta*) prob. of Japanese origin whose larva is injurious to the twigs and fruit of orchard trees and esp. the peach — called also *oriental peach moth*

ori-en-tal-ism \ōr-'ē-ent-əl-'iz-əm\ n, *often cap* (1769) 1 : a trait, custom, or habit of expression characteristic of oriental peoples 2 : scholarship or learning in oriental subjects — **ori-en-tal-ist** \-lī-\ n, *often cap*

ori-en-tal-ize \-lī-'iz\ vb -ized; -izing vi, *often cap* (1823) : to make oriental ~ vi, *often cap* : to become oriental

Oriental poppy n (1731) : an Asian perennial poppy (*Papaver orientale*) that is commonly cultivated for its large showy flowers

Oriental rug n (1881) : a handwoven or hand-knotted one-piece rug or carpet made in the Orient — called also *Oriental carpet*

ori-en-tate \ōr-'ē-ən-'tāt, -ōr-, -en-\ vb -tated; -tating vi (1849) : (with ~ vi) : to face or turn to the east

ori-en-tation \ōr-'ē-ən-'tā-shən, -ōr-, -en-\ n (1849) 1 a : the act or process of orienting or of being oriented b : the state of being oriented; broadly : ARRANGEMENT, ALIGNMENT 2 : a usu. general or lasting direction of thought, inclination, or interest 3 : change of position by organs, organelles, or organisms in response to external stimulus

ori-en-ta-tion-al \-shən-'lī-\ adj — **ori-en-ta-tion-al-ly** \-lī-\ adv

ori-ent-ed \ōr-'ē-ent-əd, -ōr-'ē-\ adj (1944) : intellectually or emotionally directed (humanistically ~ scholars)

ori-en-ter-ing \ōr-'ē-ən-'tī-ə-rīŋ, -ōr-, -en-\ n [modif. (influenced by -eer) of Sw *orientering*, fr. *orientera* to orient] (1948) : a cross-country race in which each participant uses a map and compass to navigate his way between checkpoints along an unfamiliar course

ori-fice \ōr-'ə-fīs, -ār-\ n [ME, fr. MF, fr. LL *orificium*, fr. L *ori-* mouth — more at ORAL] (15c) : an opening (as a vent, mouth, or hole) through which something may pass — **ori-fi-cial** \ōr-'fī-shəl-\ adj

ori-flamme \ōr-'ə-'flām, -ār-\ n [ME *oriflamme*, the banner of St. Denis, fr. MF, fr. ML *aurea flamma*, lit., golden flame] (1600) : a banner, symbol, or ideal inspiring devotion or courage

ori-gami \ōr-'ə-'gām-ē\ n [Jp. folded paper, fr. *ori* folding] (1956) : the art or process of Japanese paper folding

orig-a-num \ō-'rig-ə-'nām\ n [ME, fr. L. wild marjoram, fr. Gk *origanum*] (12c) : any of various fragrant aromatic plants of the mint or verbena families used as seasonings; esp. : OREGANO

ori-gin \ōr-'ə-'jən, -ār-\ n [ME *origine*, prob. fr. MF, fr. L *origo*, fr. *ori* to rise — more at RISE] (15c) 1 : ANCESTRY, PARENTAGE 2 : rise, beginning, or derivation from a source b : the point at which something begins or rises or from which it derives (the ~ of the culture is lost in the mist of time); also : something that creates, causes, or gives rise to another (this spring is the ~ of the brook) 3 : the intersection, central, or larger attachment of a muscle 4 : the intersection of coordinate axes

syn ORIGIN, SOURCE, INCEPTION, ROOT mean the point at which something begins its course or existence. ORIGIN applies to the things or persons from which something is ultimately derived and often to the causes operating before the thing itself comes into being; SOURCE applies more often to the point where something springs into being; INCEPTION stresses the beginning of something without implying causes; ROOT suggests a first, ultimate, or fundamental source often not easily discerned.

origi-nal \ō-'rij-ən-'lī, -'rij-nəl\ n (14c) 1 *archaic* : the source or cause from which something arises; *specif* : ORIGINATOR 2 a : that from which a copy, reproduction, or translation is made b : a work composed firsthand 3 a : a person of fresh initiative or inventive capacity b : an eccentric person

original adj (14c) 1 : of, relating to, or constituting an origin or beginning 2 : INITIAL (the ~ part of the house) 2 a : not secondary, derivative, or imitative b : being the first instance or source from which a copy, reproduction, or translation is or can be made 3 : independent and creative in thought or action : INVENTIVE *syn* see NEW — **origi-nal-ly** \-lī-\ adv

origi-nal-i-ty \ō-'rij-ən-'lī-'tī-\ n (1742) 1 : the quality or state of being original 2 : freshness of aspect, design, or style 3 : the power of independent thought or constructive imagination

original sin n (14c) : the state of sin that according to Christian theology characterizes all human beings as a result of Adam's fall

origi-na-tion \ō-'rij-ə-'nā-ti-ən\ n — **origi-na-tor** \-tər-\ n [1657] : to give rise to : INITIATE ~ vi : to take or have origin : BEGIN *syn* see START

origi-na-tion \ō-'rij-ə-'nā-shən\ n — **origi-na-tor** \-tər-\ n [1657] : to give rise to : INITIATE ~ vi : to take or have origin : BEGIN *syn* see START

origi-na-tive \ō-'rij-ə-'nāt-iv, -nət-\ adj (1827) : having ability to originate : CREATIVE — **origi-na-tive-ly** adv

O-ring \ō-'rīŋ\ n (1946) : a ring (as of synthetic rubber) used as a gasket

ori-ole \ōr-'ē-əl, -ōr-, -ē-əl\ n [F *oriel*, fr. L *aureolus*, dim. of *aureus* golden, fr. *aureum* gold; akin to Lith *auksas* gold] (1776) 1 : any of a family (Oriolidae) of usu. brightly colored Old World passerine birds related to the crows 2 : any of a family (Icteridae) of New World passerine birds of which the males are usu. bright black and yellow or orange and the females are chiefly greenish or yellowish

Ori-on \ō-'rī-ən, -ō-\ n [L. fr. Gk *Orion*] 1 : a giant hunter slain by Artemis in Greek mythology 2 (L. gen. *Oriónis*) : a constellation on the equator east of Taurus represented on charts by the figure of a hunter with belt and sword

ori-is-mol-o-gy \ōr-'ə-'māl-ə-'jē, -ār-\ n [Gk *horismos* definition (fr. *horizein* to define) + E *-logy* — more at HORIZON] (1816) : the science of defining technical terms : *specif* : ORIGIN

ori-son \ōr-'ə-'sən, -ār-, -zən\ n [ME, fr. OF, fr. LL *oration*, *oratio* : to pray] (12c) : PRAYER

-ori-um \ōr-'ē-əm, -ōr-, -ē-\ n suffix, pl -oriums or -oria \-ē-ə\ [L. fr. *ori-* to rise + *-um* : -ORY (haustorium)]



oriole 2

Orya \ō-'rē-(y)ə\ n (1801) : the fr.

Oryan-ist \ōr-'lē-ə-nāst, -ōr-'lē-(ə-\ n (1801) : a member of the Oryans family in its claim to the younger brother of Louis XIV

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Ory-deck \ōr-'lāp-\ n [ME *overl*]

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